It will be seen that the mode is the same in each case, but the means are very different. To ordinary observation, the two sets of flowers looked exactly alike, and the demonstration of a difference in the average, while not at all extraordinary, is interesting. No doubt such differences exist in all organisms and all characters, and one can easily see how, under certain circumstances, they may have an important bearing upon the question of survival. The great variability no doubt indicates that the number of rays is *not* at present of much importance to the Verbesina; and no doubt those organs which have become variable for this reason, but suddenly become of importance through changed conditions, afford the best material for selection. In other words, evolution will proceed fastest when there are changes in the survival-value of organs. While examining the Verbesina, I found on the undersides of the leaves a new species of spinning mite (*Tetranychus verbesinae*); a little creature about half a millimetre long, pale yellowish, with two scarlet spots on the anterior part of the body, and irregular black spots (pertaining to the soft parts) arranged somewhat in the form of a crescent. The first pair of legs is somewhat more than half the length of the animal; mandibular plate with the sides as in *T. gloveri*, but the end rounded; hairs of body moderate, on very small tubercles. Further particulars will be given elsewhere.

T. D. A. COCKERELL.

East Las Vegas, New Mexico, U.S.A., September 17.

THE INTERNATIONAL METEOROLOGICAL COMMITTEE.

IF we come to consider the work of the International Meteorological Committee and its predecessor, the Permanent Committee of the Vienna Congress, it will be impossible to deal with the subject without taking notice of all the meetings, whether Congresses or Conferences, from which the committees above named took their rise.

It may here be explained that Congresses are convened through diplomatic channels; Conferences are brought together by private invitation to meteorologists of repute.

The first attempt to convene an international meeting was in 1845, when a Conference was held at Cambridge on the occasion of the meeting of the British Association in that year. This was attended by Dove, Kupffer, von Lamont, Adolph Erman and some other foreigners, and of course by the leading meteorologists of England. The difficulties in introducing uniformity in land observations were found to be too serious for definite arrangements to result.

This was followed, in 1853, by the Brussels Conference, which was instigated by Maury. It dealt with the Meteorology of the Sea, and its action met with general acceptance among maritime nations. It may be said that our own Meteorological Office was an outcome of this Conference.

In 1863 Dove endeavoured to convene a Conference on Land Meteorology. At the meeting of the Swiss Naturforscher Verein, he invited the meteorologists of Austria, France, Italy and Spain, but the invitation was not generally accepted.

Nothing definite, however, was done for Land Meteorology until Weather Telegraphy took its rise, about the year 1860, when the demand from each nation for regular intelligence from adjacent countries rendered it impossible for any Government to ignore the subject absolutely. Still, however, every country continued to deal with its Climatology as seemed right in its own eyes.

This was the state of affairs when, in 1872, Profs. Bruhns (Leipzig), Jelinek (Vienna) and Wild (St. Petersburg) issued a general invitation to a Conference, to be held at Leipzig coincidently with the meeting of the German Naturforscher Verein. This Conference was a signal success. It was attended by 52 members, and from it all subsequent meetings took their rise.

There have been in all seventeen of these meetings.

1872. Leipzig, Conference.	1882. Copenhagen, meeting of I.M.C.
1873. Vienna, Congress.	1885. Paris, meeting of I.M.C.
Do. First meeting of Permanent Committee.	1888. Zurich, meeting of I.M.C.
1874. London, Maritime Conference.	1891. Munich, Conference.
Utrecht, meeting of P.C.	1894. Upsala, meeting of I.M.C.
1876. London, meeting of P.C.	1896. Paris, Conference.
1878. Utrecht, meeting of P.C.	1899. St. Petersburg, meeting of I.M.C.
1879. Rome, Congress.	1901. Paris, meeting of I.M.C.
1880. Berne, meeting of Int. Met. Committee.	

An elaborate *résumé* of the resolutions at all the meetings, down to the Munich Conference, was printed by the late Prof. Wild in vol. xvi. of his "Repertorium für Meteorologie."

In dealing with the action taken at these several gatherings, it is found that many of the resolutions passed at early meetings were materially modified on subsequent consideration, and this is especially the case with reference to instruments and their observation. It is therefore proposed to mention only the final outcome.

The Barometer.—The use of aneroids as independent instruments was condemned, and it was decided that all standard barometers, at Central Offices, should be compared with the standard barometers of the Bureau International des Poids et Mesures at Paris.

As regards barometer corrections, the readings in climatological tables are to be given unreduced to sea level. It is desirable to apply the Gravity correction, and at all events it is to be stated in the tables if this correction has been applied or not, and what is its amount.

The Thermometer.—In this case too the standards at Central Offices are to be compared with the standard air thermometer of the Bureau International.

No recommendation has been made on the subject of thermometer exposure, owing to the impracticability of meeting the requirements of all climates. Meteorologists are referred to the published papers on the subject by Wild and others.

The desirability of devising a really good maximum thermometer was expressed. As regards minimum thermometers, the use of amyl alcohol instead of ordinary spirit was recommended.

Maximum and minimum thermometers are to be read at the latest observing hour of the day.

Humidity.—This subject was treated at considerable length, and the employment of ventilation with the wet bulb was urgently insisted on. At the meeting of St. Petersburg, Prof. Pernter proposed to abandon the use of the dry- and wet-bulb hygrometer, and to revert to the use of the hair hygrometer, but the proposal was not adopted.

Wind.—No general form of anemometer was recommended, nor was any action taken as to uniformity of installation or of altitude. As to wind direction, the English letters N. E. S. W. were adopted owing to the misunderstandings caused by the use of "O" for "Ost" in German and for "Ouest" in French.

Clouds.—At the Munich Conference, the international scheme of Cloud Observations, Direction and Velocity, for one year, was adopted, and the results of this work have appeared. At the same meeting, the Classification of Clouds proposed by Abercromby and Hildebrandsson was adopted, and from that has come the "International Cloud Atlas."

Rain.—It was decided to place rain gauges in such positions as should preclude their being buried in snow or exposed to splashing from the ground. It was recommended to mark especially the days of precipitation which did not reach the limit of 1 mm. and to ignore falls below 0·1 mm. Two columns are to be given

for Snow, one for amount, and the other for depth on the ground.

Unusual Occurrences.—The well-known international symbols were adopted at the Vienna Congress.

Glaciers.—A general recommendation was made to institute measurements of the motion of Glaciers.

Earth Movements.—The statements of Monsieur de Rossi, at Rome, as to what he terms "la météorologie endogène" were received with much interest.

As regards other matters, various combinations of hours for observing were suggested.

The simultaneous observations, proposed at Vienna, by the Chief Signal Office of the United States, were strongly supported.

As regards Weather Telegraphy, an international code for the messages was adopted and various details were settled.

The International Forms for the publication of climatological data (stations of the Second Order) were all arranged and have been very generally adopted.

Among the most lasting and valuable results of these gatherings has been the volume of International Tables, published by Gauthier Villars in 1890.

At several meetings endeavours were made to organise an International Office for directing international work, and this resulted in a proposal for an International Directing Bureau. This scheme, however, failed to secure approval. Various resolutions were framed as to international investigations.

The whole scheme of International Balloon Ascents, superintended by Prof. Hergesell, of Strassburg, took its origin at the Paris Conference of 1896.

The Circumpolar Observations of 1882-3, on the scheme of the late Lieutenant Weyprecht, also took a definite shape at the Roman Congress.

Terrestrial Magnetism.—This subject was first discussed at the Munich Conference in 1891, and at the Paris Conference of 1896 a special committee *ad hoc* was appointed, under the presidency of Sir A. Rucker, and in the report of that conference its action can be seen.

R. H. S.

JOHN HALL GLADSTONE.

THE scientific world has lost an indefatigable worker by the sudden death of Dr. Gladstone, which occurred on Monday, October 6. Few men had a larger circle of friends, for the beauty of his character and the kindliness of his nature endeared him to all those who had the good fortune to know him.

Dr. Gladstone was born in London in 1827, and was educated at University College, London, and Giessen University. He was twice married, first, in 1852, to May, daughter of the late Charles Tilt; and secondly, to Margaret, daughter of the late Rev. D. King and niece of Lord Kelvin. So early as 1850 he became lecturer on chemistry at St. Thomas's Hospital, and three years later (in 1853) he was elected a Fellow of the Royal Society. He served on its Council in the years 1863-1864 and again in 1866-1868, and a few years ago received the Davy medal. The Royal Society list of papers credits him with more than a hundred contributions to scientific literature, apart from those in collaboration with other writers. He held the Fullerian professorship of chemistry at the Royal Institution from 1874 to 1877, was first president of the Physical Society from 1874 to 1876, and was president of the Chemical Society from 1877 to 1879.

There can be no question, as an eminent English physicist has recently pointed out, that Dr. Gladstone was "one of the founders of physical chemistry, a fact which is fully recognised abroad, where his rightful position is accorded him." It is, however, only necessary to show how highly his work was appreciated in England to quote the reference to it which was made in 1898, on the occasion of a banquet to past presidents of the Chemical Society who had been Fellows of the Society for half a century, of whom Dr. Gladstone was one Prof. Dewar then said, "Gladstone has worked out his long and brilliant scientific career as a labour of patient love. Furthermore, he has created an entirely new department—that which is in modern times regarded as physical chemistry. For half a century he has worked on this side of chemistry, for his early investigation of the spectrum of the atmosphere was one of marvellous suggestiveness. He found that the spectrum of Fraunhofer varied at sunset and at sunrise from that at midday, and showed that a large number of those absorption lines must originate in the earth's atmosphere. That discovery stimulated further inquiry as to the substance that could produce these lines so characteristic of the solar atmosphere; and later experimenters have found it in the vapour of water and in oxygen. Gladstone's greatest merit, however, lies undoubtedly in his optical researches on the atomic refractions and dispersions of the elements. He has determined the optical constants of hundreds of bodies, and has thus stimulated inquiry in that borderland between physics and chemistry which is so much cultivated in the present day, and the pursuit of which has added so much to our knowledge. He has also contributed largely to miscellaneous inquiries, especially those connected with various voltaic batteries, and other questions conducive to the study of both organic and inorganic chemistry."

His work was remarkable for its very varied nature. The title of his first paper was "Contributions to the Chemical History of Gun-cotton and Xyloidine," and, true to this early promise, he served as a member on the Gun-cotton Committee of the War Office from 1864 to 1868, having previously served as a member of the Royal Commission on Lights, Buoys and Beacons (1858-1861). Among his less known work, his investigations in connection with early metallurgical history well deserve mention. For instance, he showed that the use of bronze in Egypt went back as far as 3700 B.C., and that not only was bronze used, but that it was of a type common to much later periods, the ratio of copper to tin being as 9 to 1.

It is as an educational reformer that many of Dr. Gladstone's friends will best remember him, for he worked hard for twenty-one years, beginning in 1873, as a member of the London School Board, upon which body he represented the Chelsea division, and was for three years its vice-chairman. He was unwearied in his insistence upon the necessity for teaching science in elementary schools, keeping steadily in view its influence upon the nation as a whole. His attitude may best be gathered from the concluding sentence of his presidential address delivered before the members of the Chemical Section of the British Association in 1872. It ran as follows:—"While the rudiments of science are being infused into our primary education, now happily becoming national, while physical science is gradually gaining a footing in our secondary and our large public schools, and while it is winning for itself an honoured place at our universities, it is to be hoped that many new investigators will arise and that British chemists will not fall behind in the upward march of discovery, but will continue hand in hand with their continental brethren, thus to serve their own and future generations."

The prevailing ignorance of science and scientific methods is constantly rebuked by modern educational writers, but a sentence such as the following, which also occurs in Gladstone's presidential address in 1872, was unusually plain speaking for twenty years ago. He says "the so-called educated classes in England are not only supremely ignorant of science, they have scarcely